

## *Material and Nonmaterial Cultural Evolution in Human and Bonobo*

### **SET I**

#### *A. The Research Question to be pursued at the \$100,000 level.*

We wish to pursue the following research question:

The overarching goal of this project is to conduct a series of interdisciplinary investigations exploring the depth and complexity of bonobo nonmaterial culture with an emphasis on the implications such investigations have for human identity, distinctiveness, and transcendence. The impetus that guides our project can be put in the form of a question: Is it possible that investigations of cultural development in nonhuman apes (with a particular emphasis on bonobos) have been biased by excessive attention to aspects of material culture as contrasted with nonmaterial culture and therefore that bonobos manifest a significantly evolved nonmaterial cultural capacity that has gone unrecognized?

We suggest that modern studies of human origins have a bias toward material culture for two reasons: a) artifacts are all that remain from previous hominid cultures, and b) as a group, humans tend to focus on advancing their well being through advancing material culture. If bonobos have evolved an elaborate nonmaterial culture, it is quite possible that we would not notice it because we have focused on material cultural advances as the ‘hallmark’ of advanced intelligence.

In order to appropriately address this topic, we will also seek to provide comparisons and contrasts with indigenous human groups who manifest different degrees of development of nonmaterial culture.

#### *B. The Significance of the Research Topic*

In a recent article reporting upon the ways of life of the Piraha in Brazil, Dan Everett, a linguist who has studied the tribe since 1978, noted the following “This is a culture that is invisible to the naked eye, but that is incredibly powerful, the most powerful culture of the Amazon and maybe of the world.” Of course, the very nature of nonmaterial culture makes it easy to overlook and often difficult to study. However, as was the case with Everett, immersion in the culture allows one to become attuned to the beliefs and values, unique traditions of meaning making and spirituality, and the arts and music that make up the nonmaterial culture. Likewise, intense immersion with a group of bonobos with a theoretical lens that looks for these components allows for exploration of the nonmaterial aspects of their culture.

To obtain a sense of the implications such a series of investigations might have, consider the following questions: What would it mean if musically inclined humans can share meaningful music-making experiences with musically inclined bonobos? Or what if we were to discern that bonobos are capable, under the proper environmental

conditions, of producing meaningful art works? Or if we find that they exhibit a sensitivity to and awareness of each others' thoughts, feelings, motivations and desires which build upon or transcend the kind of awareness of the other commonly experienced by the human species?

We believe that these questions carry profound implications regarding the nature of human distinctiveness, which are foundational to philosophical and religious justification systems. Howell (2006), for instance, proclaims "To speak of humankind and other-kind perpetuates the idea of unsubstantiated absolute difference. Hierarchical and value burdened categories of the unique Self and the Other create too much separation and too much temptation to exploit and marginalize the Other—other animals and other humans. Theology must recast uniqueness, equating uniqueness with the intrinsic value and differences evident in all species and individuals, as well as the cosmic community embodied in the divine." (p. 960).

Multiple dimensions and textures of transcendence are evoked not just by reflection on humans in their relationship with God and community, but by encounters with bonobos, primates who are close genetic and evolutionary kin with humans. The promise for theological and philosophical reflection on bonobos is rooted in their social adaptation as a highly cooperative species with keen social intelligence. The grant project provides occasion to explore how interdependence, sociality, and culture in bonobos provide windows on the concept of transcendence. Various textures of transcendence reflect multidirectional relationships among bonobos, humans, and the Sacred, which move beyond anthropocentric and individualistic paradigms to explore how transcendence involves complex relational frameworks. Moving beyond (but indebted to and informed by) previous studies of human uniqueness and self-transcendence, the proposed dialogue between science and religion explores diverse models of transcendence, which arise from broadening the scope of inquiry to include embodied and relational concepts of transcendence. Furthermore, by exploring the nature of culture and questioning elements of human distinctiveness, we will be raising foundational questions regarding the ultimate nature of reality.

*C. The methodology to be used in the research, specifically how this methodology represents the inter-disciplinary nature of the STARS program.*

*1. Exploration of Nonmaterial Culture (Fields and Savage-Rumbaugh)*

Nonmaterial culture is the ethical, moral, artistic, musical and spiritual aspects of a group of apes, human or nonhuman. The manner in which immersion in a particular context gives rise to various behavioral expressions is a crucial question. Further, we suggest that 'invisible' cultural traits are acquired in a manner that is almost imperceptible in indigenous peoples and in bonobos. A 6 month old child in the Congo, barely able to crawl, can nonetheless produce a complex rhythmic pattern on a tree drum. A three year old girl, unable to count, can nonetheless produce extremely complex bead patterns among the Huicholes as soon as she is able to attach the needle to the thread. Similarly, by age 3 some Longondo children are able to produce a complex whistle language, which is as

complex as a spoken language. Such whistles appear as soon as they can learn to cup their hands to produce the proper sounds.

No overt teaching of any of these complex cognitive skills is required or performed. Surely if skills of this level are being acquired in an imperceptible manner, morality, ethics, art, and music are being acquired from the cultural ethos as well. Understanding the process by which such transmissions occur is crucial, for with such an understanding we might be able to more effectively guide the direction cultural processes unfold and the extent to which certain aspects (e.g., competition and materialism) are emphasized in contrast to others (e.g., communalism and spirituality).

The justification for this belief is seen in the fact that human societies vary tremendously in the presence or absence of such behaviors. For example, although the vast majority of human cultures have been known to utilize physical force, there are selected cultures such as the Huicholes, who have never fought and whose culture precludes fighting, either among themselves, or with outside people.

Bonobos also have a peaceful culture. They live in tribes of 40 to 100 which exhibit peaceful relations both within and between tribes. They rarely fight and the entire group participates in nearly constant child care. They coordinate their group movements through the forest with enormous skill, feeding the group often traveling not more than 3 hours a day. This is a feat that humans, who supplement their diet with swidden agriculture and hunting, have not mastered. The ability of bonobos to exist in such large and peaceful groups, in contrast to other apes (human and nonhuman) and to utilize the forest more effectively than the humans who are sympatric with them, presents the possibility that the bonobos may have evolved much cultural complexity that we would benefit greatly from learning about.

We propose to search for complex nonmaterial cultural processes in both captive and wild bonobo groups, and to complement our search with information on various non-nomadic indigenous human populations. The search will be for complex cultural processes that are manifest in full. These will be examined at the cultural level, not just at the individual level. We intend to employ a mixed methodological research paradigm in exploring these processes. One will be more experiential and qualitative, and we will use the 'interview technique' as a central means of gathering data, through language, since group members, both bonobo and human, understand language in various degrees and can be interviewed, in various degrees. We also see many fruitful possibilities in George Ellis' emerging mathematical methods for measuring degrees of cultural change. This complex, dynamic system may offer better quantitative measures of cultural processes and development than previous models.

Within the captive group we will specifically test for the ability to read, acquire lexigrams without exposure to speech, translate vocalizations into symbols, and produce representational art. With the wild groups we will specifically test for the present or absence of symbolic messages constructed by the manipulation of foliage, the ability to send scouts to other areas to report back on the state of that area, the ability to engage in a proto-swidden agriculture and the presence or absence of multiple home base dwellings.

### *2. Musical Capacities of Bonobos (Gray, Fields, and Savage-Rumbaugh)*

Human music spans from simple rhythmic interactions to melodic chants to highly orchestrated instrumental or operatic works to hip-hop. While large numbers of the human population lack basic competency in specific musical styles that may require formal training, the perception of music is basic to all humankind now and throughout all known history. This universality of music appreciation and participation suggests deep evolutionary roots.

Biomusicology is the study of music from a biological point of view. More specifically, biomusicologists analyze the evolutionary origins of music, the multiple neurological areas involved in the processing and production of music, and comparative analyses of musical values, systems, and musical behaviors across species lines. Of course, music represents a crucial and universal aspect of human culture, and thus studying ways in which bonobos use music and the manner in which humans and bonobos might participate in musical exchanges offers exciting possibilities for opening new avenues for observing the depth and complexity of the mental lives of bonobos. Up until this point, much of the music research with great apes is dependent upon requiring apes to participate in a specific human music culture (i.e. the Western music system).

We are proposing a different approach that examines human/bonobo vocalizations and human/bonobo improvisations with human musical instruments, the way we would if we humans encountered and tried to participate in a musical system that we weren't culturally attuned with already. That means, of course, that we must deconstruct our culturally defined understanding of music to find the core values in common with the other music. We do this easily with unfamiliar human cultures' music-making by first finding the beat, listening for rhythmic patterning, repetition, synchrony, melodic patterns and structures and their repetitions. Early forays into this research method have turned up new and very interesting results when analyzing interactions between human/bonobo - speech/vocalizations patterns as well as analyzing the improvisations between humans/bonobos on musical instruments. We're finding synchrony, phrase structure, rhythmic motifs, melodic and rhythmic imitation of bonobos by bonobos, melodic and rhythmic imitation of humans by bonobos, conscious and unconscious human rhythmic imitation and synchrony with bonobos (i.e. music-making).

Music-making has long been known to be a behavior that produces emotional and transcendent experiences for humans. There is neurological and neurodynamic research about its kinship with dreaming, hypnosis, meditation. Its ability to alter physiological states, to overcome pain, and to assist in healing has also been demonstrated. The brains of human individuals ‘musicking’ together are synched in a way that transcends place and body. Furthermore, it is a state where self-talk does not exist – and hence, it’s not a place of language or the kind of organization of information that language typically provides.

*3. Exploring Bonobo Capacities for Self-Justification (Henriques and Savage-Rumbaugh)* A key part of the Tree of Knowledge System developed by Henriques (2003) is the claim that processes of justification provide a frame work for understanding the evolution of human self-consciousness and culture. Specifically, Henriques offered the Justification Hypothesis which posits that the evolution of symbolic language created a novel and unique adaptive problem—humans became the only animal that had to explain why it did what it did. Although detailed articulation of the JH is beyond the scope of this grant, Henriques (2003) argued that social psychological phenomena such as cognitive dissonance and the self-serving bias could be understood from this evolutionary adaptive framework. From the vantage point of the JH, linguistically trained bonobos like Panbanisha and Kanzi raise fascinating questions about the development and processes of justification, such as: Do these apes experience cognitive dissonance or evidence a self-serving bias? Several discussions of these questions have yielded research designs that require interview and question methodology, with video-taped replies. Furthermore, recent analyses of the functional dimensions of Ape-Human discourse demonstrate that human-bonobo symbolic interactions involve turn-taking, power relations and complex navigations between confrontation and support (Benson & Greaves, 2005). Our investigations will extend these analyses in particular by looking for “reason giving” behaviors in bonobos.

The view that the “self” must justify the actions of the ‘me’ according to culturally proscribed dictates and that the self must constantly evaluate the actions, motives, stated intentions etc of the ‘me,’ not only begs the question of who it actually is that is evaluating the ‘me’ in me, but it also raises the issue of whether or not the ‘justification’ – which must be culturally acceptable and which is culturally determined--might not provide a portal for transcendence. That is, cultural expectancies that stress the rights and responsibilities of the individual, the ego of the individual and the separateness of the individual will likely produce different kinds of explanations, rationalities and that cultural expectancies that stress the connectedness of the group, the connected of the past and the future, the role of the individual in the maintenance of group harmony, etc.

*The inter-disciplinary nature of this program.* The confluence of methodologies above are drawn from music theory, experimental psychology, clinical psychology, ethnographic anthropology, and comparative anthropology.

They represent an approach that is inherently inter-disciplinary and cross cultural by the nature of the questions themselves and through the design of the project. Simply put, it would not even be possible to conceive of this project, or to carry it out from other than an interdisciplinary approach with an interdisciplinary toolbox of methods.